# NOTES ON AUSTRALIAN CESTODES

BY

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## VI. *SCHIZOTAENIA CACATUAE*, sp. nov.

This cestode was found in two individuals of the species *Cacatua galerita*, Lath., the common sulphur-crested white cockatoo. One of these was shot on the mainland near Townsville, North Queensland, and the other on Magnetic Island; but as this island is quite close to the mainland, and birds frequently fly from one to the other, the difference in locality is of no importance.

External Anatomy.

The length of fixed specimens is up to 200 mm., and the maximum breadth 5 mm. On the whole, the segments are broader than long, but in the anterior immature portion some proglottides longer than broad are found. These longer segments are not regularly placed, and alternate irregularly with ones that are broader than long. When it occurs, the increase in length is not at the expense of breadth, so that the gradual uniform increase in width is not interrupted. Macroscopically, along the median axis of the chain there is frequently a line of depressions, one in each segment; these taken together form a longitudinal groove. This groove is most marked about the central portion of the worm. The posterior angles of the segments scarcely project beyond the edges of the ones immediately succeeding them, and as development is very slow the result is that proglottides are almost rectangular in shape.

*Head.* The scolex (fig. 1) is almost flat anteriorly, with no rostellum, and has a maximum breadth of 0·240 mm. through the centre of the suckers. The four suckers are placed close to the anterior end, they are flat and circular and do not stand out from the surface; they measure about 100$\mu$ in diameter, and look outwards and very slightly forwards.

*Segments.* Passing posteriorly, the worm becomes gradually narrower and is unsegmented for a distance of 0·8 mm., at which point it is only 0·130 mm. broad.

At first the young proglottides are all broader than long, but when about 0·5 mm. broad many of them may be longer than broad, as detailed above. At this stage the developing reproductive organs can be clearly seen, and it is thus early apparent that the genital pores are unilateral, opening on the right side (fig. 2).

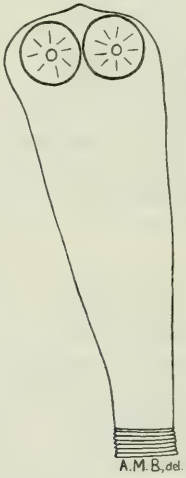


Fig. 1

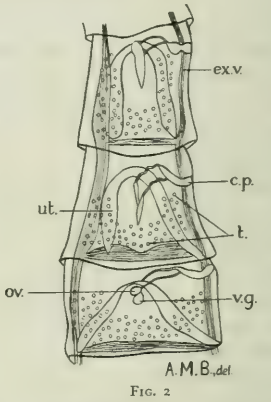


Fig. 2

Fig. 1. *S. cacatuae.* Scolex. × 95.

Fig. 2. *S. cacatuae.* Young proglottides. *c.p.*—cirrus pouch; *ex.v.*—excretory vessels; *ov*—ovary; *t*—testes; *ut*—uterus; *v.g.*—vitelline gland. × 27.

Sexually mature proglottides in fixed and mounted specimens measure about 4 mm. broad and 1 mm. long.

Internal Anatomy.

*Muscular system.* The longitudinal muscle is disposed in a single stout layer. Internal to this a thin layer of transverse muscle fibres occurs. Dorso-ventral fibres are fairly well developed.

*Nervous system.* This was not investigated.

*Excretory system.* The lateral excretory vessels lie well towards the lateral borders, and pass ventral to the cirrus pouch and vagina. The dorsal vessel lies on the outer side of the ventral, the latter being joined by a transverse commisural vessel, which runs across the posterior of each segment. The vessels present many variations in

different segments. These variations are most easily seen in young proglottides, and the chief departures from the normal are as follows. The ventral vessel may suddenly dilate about the centre of its course through a segment, and the ends remain of normal calibre, thus forming a fusiform sac. Another common variation is a dilatation into a circular cavity at the junction of the ventral and transverse commisural vessels on each side, which dilatation may extend for some distance along the transverse vessel. Also there is occasionally a branch extending inwards and forwards, from the postero-lateral expansion just mentioned, but in no instance could a connexion between the dorsal and transverse vessels be observed.

*Genitalia.* Development of the sexual organs is slow, and over one hundred proglottides are found, with the sexual organs sufficiently developed to be clearly distinguished before the uterus contains any eggs, and long after this organ has begun to fill the sexual organs remain quite distinct, their atrophy being proportionally as slow as their development.

*Testes.* The testes are large and very numerous, there being over one hundred in each segment. They occupy practically the whole antero-posterior field of the medulla on each side of the ovary. These two groups of testes are united by a bridge of the same glands passing posterior to the ovary. They lie only very slightly dorsal to this organ. The group on the aporal side is somewhat more numerous than the one on the pore side, and it extends dorsal to, and in some cases overlaps the excretory vessels. The testes in the lateral groups are relatively large oval bodies measuring about 200$\mu$ by 0·30$\mu$, but those more centrally placed, which form the post-ovarian bridge, are smaller (about 100$\mu$) and more circular in outline (fig. 3).

*Vas deferens.* Separate vasa efferentia could not be distinguished, but the vas deferens is seen passing dorsal to the ovary; it runs at first forwards and then it curves laterally to the right running transversely across the right anterior portion of the segment. There is no vesicula seminalis. The cirrus pouch lies dorsal to the excretory vessels and nerve, and on a plane slightly dorsal of the testes. When fully developed it is an elongate sac lying transversely in the right anterior quadrant of the segment measuring about 300$\mu$ long by 130$\mu$ broad, and having a bluntly rounded mesial extremity.

As a rule, in the mesial portion of the sac a few coils of the vas deferens can be made out. The cirrus, when extruded, measures about 650$\mu$ long, and is slightly thicker at the base than the apex, and its outer surface is thickly covered with spines. The atrium is about 160$\mu$ deep and 60$\mu$ in diameter, and it opens on the external surface near the right anterior corner of the segment, its external opening having thick everted lips.

*Ovary.* The ovary is practically in the mid line and lies towards the anterior surface of the segment, it is composed of a number of discrete lobes radiating fan-wise. It is slightly asymmetrical, as

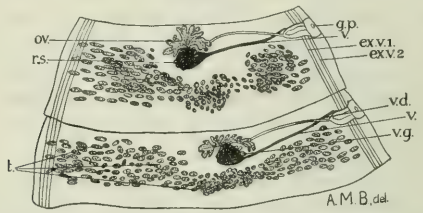


FIG. 3. *S. cacatuae.* Ripe proglottides. *ex.v.*1.—ventral excretory vessel; *ex.v.*2.—dorsal excretory vessel; *g.p.*—genital pore; *ov*—ovary; *r.s.*—receptaculum seminis; *t*—testes; *v*—vagina; *v.d.*—vas deferens; *v.g.*—vitelline gland. × 17.

there are a few more lobes on the aporal than on the pore side. The ducts from the various lobes run centrally, and enter a common duct, behind the centre of the gland. This duct runs posteriorly, and just before it joins the duct from the vitelline glands is surrounded by the shell gland (fig. 3).

*Vitelline glands.* The vitellarium is of similar structure to the ovary, being composed of a number of discrete lobes, which are united by ducts meeting in a point just in front of its centre. It is more or less divided into right and left halves, the larger of which is on the right side. It lies immediately behind the centre of the ovary.

*Receptaculum and vagina.* The vagina opens antero-ventral to the cirrus and passes inwards along the anterior border of the cirrus sac, slightly ventral to it. It crosses the vas deferens ventrally and runs parallel to it to enter the receptaculum seminis which lies dorsal to the vitelline and shell glands. The duct from the receptaculum

to the oviduct cannot be made out, as the former organ completely overlies this part of the field.

*Uterus*. The uterus is visible at a comparatively early stage, and is at first seen as a relatively wide, horse-shoe-shaped tube curving round the ovary anteriorly, and terminating on each side near the postero-lateral angles (fig. 2). When eggs first begin to appear in it, they are situated in the two extremities only, and soon subsidiary pouches

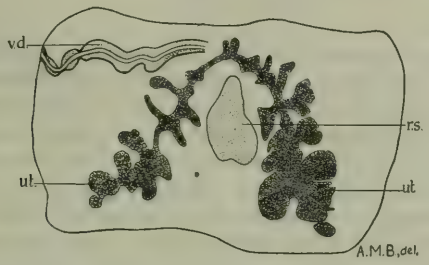


Fig. 4. *S. cacatuae*. Uterus partly developed. *r.s.*—receptaculum seminis; *ut*—uterus; *v.d.*—vas deferens. × 17.


Fig. 5. *S. cacatuae*. Uterus more fully developed. *r.s.*—receptaculum seminis; *ut*—uterus; *v.d.*—vas deferns. × 17.

are thrown out from it both internally and externally, so that its original tubular structure is lost, except in the mesial part in front of the ovary, where the development of subsidiary branches is never marked (figs. 4 and 5). The most advanced stage of development of the uterus which was observed is shown in fig. 5, here the uterus is seen as two large branching sacs occupying practically the whole

of the lateral fields united anteriorly by a narrow tubular portion. The receptaculum seminis persists throughout, and also remains of the vitellarium can be made out for a long time after all other sexual organs have disappeared. These lie in a central position, and the uterus bends round them. The degenerate reticular nature of the uterus described by Douthitt (1915) was not apparent in our specimens.

*Eggs.* No mature eggs were seen.

DIAGNOSIS.

This species agrees with the genus *Schizotaenia* as described by Ransom (1909), except that the genital pores are unilateral.

As far as the writer is aware, this is the first member of the genus to be described from Australia, and still more important, it is the first *Schizotaenia* to have ever been found in a bird, all those hitherto described being from mammals. But other genera of the sub-family *Anoplocephalinae* have been recorded from avian hosts.

The name *Schizotaenia cacatuae*, after its host *Cacatua galerita*, is suggested.

Type specimens of this cestode are in the Museum of the Liverpool School of Tropical Medicine.

## REFERENCES

DOUTHITT, H. (1915). Studies on the cestode family *Anoplocephalidae*. *Illinois Biological Monographs*. Vol. I, No. 3.

RANSOM, B. H. (1909). The Taenoid Cestodes of North American Birds. *Bull. 69, U.S. Nat. Mus.* Washington.